ARCHITECT'S
FIELD REPORT X OWNER X ARCHITECT _CONTRACTOR _ FIELD

PROJECT: Masonry Facade Evaluation
Newington Town Hall
131 Cedar Street
Newington, CT 06111

FIELD REPORT NO: 1
PROJECT NO.: 15-32

CONTRACT: Diversified Technology Consultants
2321 Whitney Avenue, Suite 301
Hamden, CT 06518

DATE: February 20, 2016 TIME: n/a WEATHER: n/a TEMP. RANGE: n/a

EST. % OF COMPLETION: n/a CONFORMANCE WITH SCHEDULE (±): n/a

WORK IN PROGRESS: n/a PRESENT AT SITE: Martin A. Benassi MAB Architect

INTRODUCTION

1. **History:**

A. We received a telephone call from Steve Gendreau, P.E. of DTC on December 17th requesting a proposal to perform a masonry facade evaluation of the Newington Town Hall. An initial site visit was made on December 21st to walk the facility and determine the magnitude of the scope of work. A proposal dated December 22, 2015 (revised January 8, 2016) outlining our services was mailed to DTC and accepted.

B. This was to be a visual, non-destructive type of evaluation based on my initial site visit and subsequent review of various construction documents. No openings were taken to examine or verify the internal wall construction.

2. **Building History:**

A. The building's history of modifications/alterations over the years includes:

1) Originally constructed as a High School in 1949;

2) Music and Cafeteria/Kitchen addition in 1955;

3) Conversion to Government facilities (Town Hall, Board of Education, Parks and Recreation Department) in 1970s.

B. The original 1950 and 1959 additions to the High School were designed by local architect Ernest Sibley of Victor A. Frid Architects in West Hartford. Subsequent 1971, '72, and '73 additions were designed later by another local firm, Hirsch•Kaestle•Boos of New Britain.

C. Over the years, numerous existing condition assessment and proposed facility use studies have been done, including one by Kaestle Boos Associates dated January 28, 2008; and one most recently dated July 17, 2012 by Olsen Design Group Architects of Reading, Pennsylvania.

3. **Data Collection:**

A. In addition to the initial site visit, electronic copies of the following documents were provided for our review:

1) Disc #1: 1950 documents, 1990 Social Services Dept., Town Hall electrical, plumbing, HVAC, structural

2) Disc #2: Town Hall Renovations, Construction Documents, 2009

3) Disc #3: Various construction documents dated 1950, 1959, 1971, 1972 phase II, 1973 phase III, 1982, 1990 Social Services Dept., 2006 interior renovations, 2007, 2008, Arch 07047, Land 07047, Roofing, Struct 07047, Survey, Newington plan, No 3 second floor plan and roof

4) *Feasibility Study Town Hall Expansion/Renovations* by Olsen Design Group Architects dated July 17, 2012

4. **Format:**

A. This survey is organized into sections including: Introduction, Observations, and Recommendations. The *INTRODUCTION* contains a concise history of the project from commission through site visit(s) including dates, times, and personnel involved.

The *OBSERVATIONS* section summarizes the conditions that existed at the time of the site visit and identifies the probable causes of damage and failure. Also included are the appropriate photographs taken during the site visits, which we identify and describe in the accompanying text.

The *RECOMMENDATIONS* section provides what are, in our opinion, the most cost-effective solutions for the problem areas found.

B. This Report, including all of its appendixes, is ***NOT FOR CONSTRUCTION*** and was prepared for the sole use by the Client, building Owner, and the Architect.

OBSERVATIONS

1. **General:**

A. The original multi-story building has exterior masonry bearing walls. The exterior masonry walls bear on reinforced concrete foundation walls and footings. In general, the exterior wall masonry construction consists of brick veneer applied to concrete masonry units with no air gap.

Photo 1

Photo 2

Photo 3

Photo 4

2. **Masonry:**

A. Brick is the most prevalent material on the exterior of the building. The brick appears to be of a standard, SW, type FSB suitable for this application. To be certain, brick samples can be tested by a lab such as **Material Testing Inc**. in New Haven in accordance with the following:

1) *ASTM C20 - 00(2015) Standard Test Methods for Apparent Porosity, Water Absorption, Apparent Specific Gravity, and Bulk Density of Burned Refractory Brick and Shapes by Boiling Water*

B. In addition to having the brick tested, the mortar should also be tested to verify its type and hardness:

1) *ASTM C780 Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry*

2) *ASTM C 1324-96 Test Method for Examination and Analysis of Hardened Mortars*

C. Several defects were observed including spalling of the face brick, cracked brick, and deteriorated mortar joints which permit water infiltration into the wall assembly. The trapped moisture will then freeze in cold weather, causing the brick to crack or spall even more. Once this happens, the brick can absorb moisture and contribute to additional freezing and deterioration of the wall.

D. Specific areas which require restoration include:

1) Chimney: There is severe spalling of the brick face on the chimney surface, resulting in the mortar's being left exposed. There are several reasons this may be happening, including having the brick sandblasted (which removes the hard, backed-on surface of the brick and allows moisture to be absorbed into the brick). Also a possibility is a poor bond between the brick and the mortar, allowing water to penetrate the surface. A poor bond can be a result of not wetting the brick on a hot summer day, which allows the brick to suck the moisture out of the mortar before it has a chance to set/bond properly. Mortar used should not be harder than the surfaces it is bonding (in this case, the brick). Type N (750 psi) is the preferred standard for exterior above grade use according to ASTM C270. A Type S (1,800 psi) mortar is acceptable for below or at grade level. If the mortar is too hard, it will restrict the brick's movement.

Photo 5

Photo 6

2) Efflorescence: Efflorescence is a sign of moisture entry into the wall. In general, bricks will not allow enough moisture through to cause extensive efflorescence to occur. Water which does penetrate the wall (through defective brick, mortar joints, hairline cracks between mortar and brick, defective roofing and flashing) will then travel through the substrate and leach out, leaving salt deposits on the face of the brick - also known as efflorescence.

Photo 7

3) Knee Wall: All building materials change in volume due to internal or external stimuli. These stimuli may be changes in temperature, moisture, elastic deformation due to loads, creep, or other factors. Moisture is entering the knee walls from joints in the coping stones, gaps along the steps, and deteriorated mortar. The condition only gets worse as time goes on and more moisture penetrates the knee wall from all sides.

Photo 8

Photo 9

4) Canopy: Moisture has penetrated into the structural concrete slab of the canopy, causing the reinforcing steel to rust. Rusting steel will exfoliate, expand and crack the concrete and masonry wall, resulting in a structurally unsound condition that should be addressed for safety reasons. Removal of the canopy is recommended.

Photo 10

Photo 11

5) Flashing: Wall flashing helps to divert water that penetrates the wall back to the exterior of the structure. This is important with respect to window and door heads where rusting of the jamb and frame would result. Flashing also protects steel lintels from rusting. Also known as exfoliation or surface corrosion, rusting causes the steel to expand, damaging the brick while weakening the steel. Flashing is called for on the details. However, there most likely are no end dams to prevent the water from migrating down along the jambs. Also, there are no weeps visible anywhere on the building - window head or along the base of the wall. Newer details call for the flashing to extend beyond the face of the wall and lintel to form a drip.

Photo 12

Photo 13

6) Weeps: The weep hole is designed for two purposes. First, it provides an opening to allow water to drain out through the bottom of the wall or along the flashing as noted above. Secondly, it is intended to allow ventilating air to enter behind the wall to help dry the structure. No weeps were observed anywhere on the building.

Photo 14

3. **Roofing**:

A. Roofing/Gutter: Some of the water staining on the masonry wall can be traced to defects in the built-in-gutter system and/or roof. It is my understanding that part of the scope of work is to reroof the building. This obviously needs to include all new gutter and downspout systems.

Photo 15

Photo 16

4. **Sealant**:

A. There are two main classifications of building joints: static and dynamic. Static joints are those where the joint is non-moving, such as the sealing of window sills and jambs. Dynamic joints are those which experience movement through expansion or contraction.

B. Most of the sealant failure observed is cohesive. This is especially true around window and door openings.

C. The best sealant for most applications would be one with a high Class rating to withstand the movement between the different substrates, is a single component, is non-sagging, and can adhere to as many different Use groups as possible (such as a one-part natural silicone sealant). The life expectancy of a high grade sealant is approximately five years.

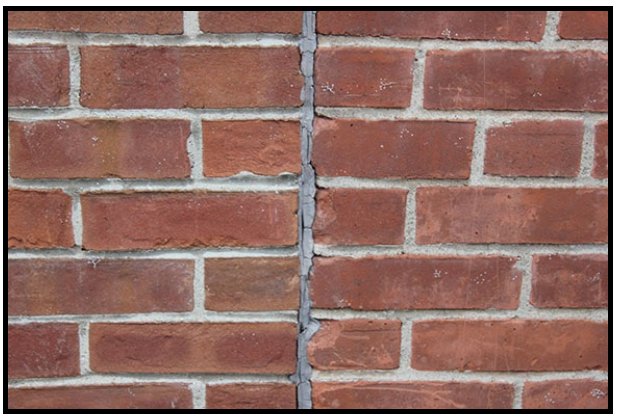


Photo 17

RECOMMENDATIONS

1. It is our professional opinion that the masonry facade of the building is in overall fair to good condition with some recommended required remedial repairs to maintain the overall integrity of the facility. These include:

   A. Cleaning of the entire building facade using a commercial grade solvent cleaner such as *Sure Klean* ® by Prosoco: http://www.prosoco.com/sure-klean/

   B. Replace any damaged or defective brick with new brick to match existing in type, size, and color.

   C. Repoint any damaged or defective mortar with new Type N mortar to match existing color and profile.

   D. Open and inspect existing steel lintels. Install new flashing/weeps at all window and fenestration headers to prevent possible future damage.

   E. Remove canopies and open wall to inspect steel framing and replace/repair any damaged steel areas.

   F. Remove existing and install new closed-cell backer rod and sealant throughout.

   G. Rebuild knee walls/stairs as required.

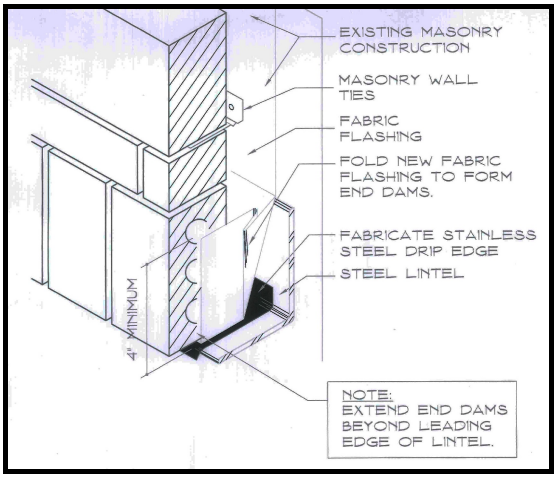


Photo 18

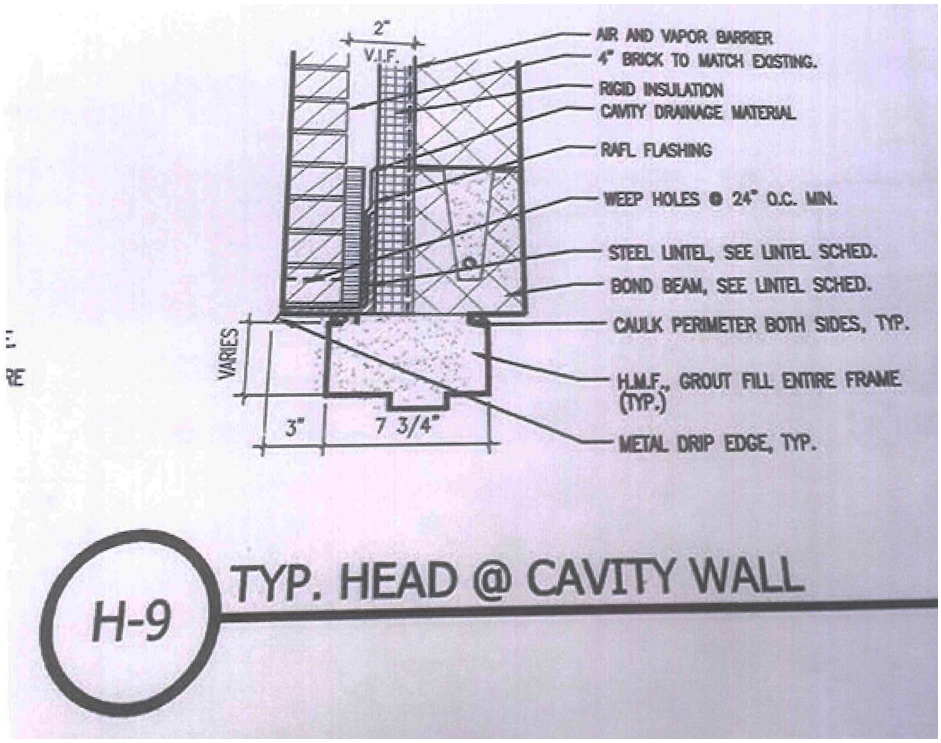
We hope this masonry facade evaluation is as anticipated and helps in your decision-making process. Should you have any questions regarding its contents, please feel free to call us.

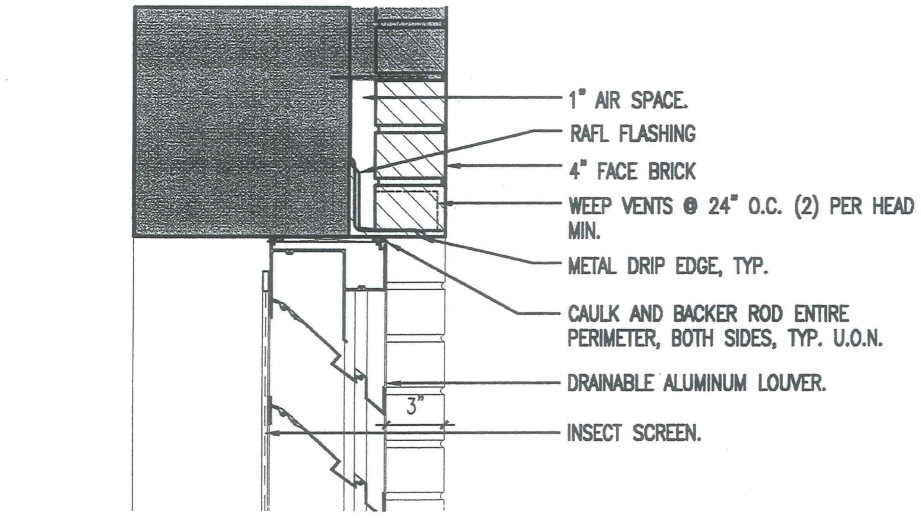
REFERENCES:

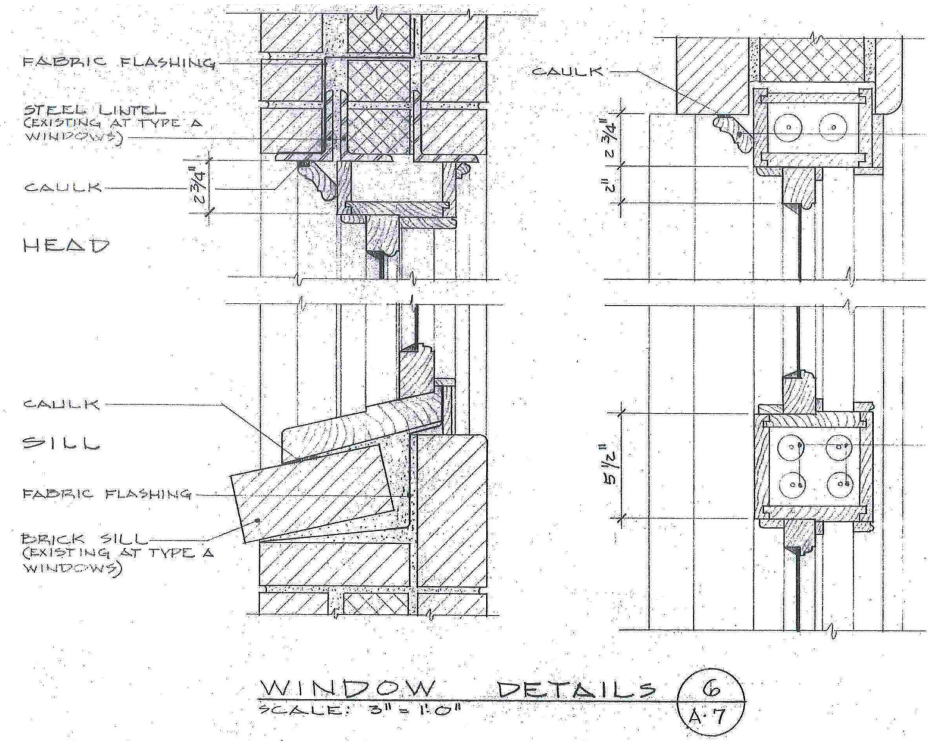
ASTM Standards in Building Codes
US Department of the Interior - Preservation Brief 2 - Repointing Mortar Joints in Historic Masonry Buildings

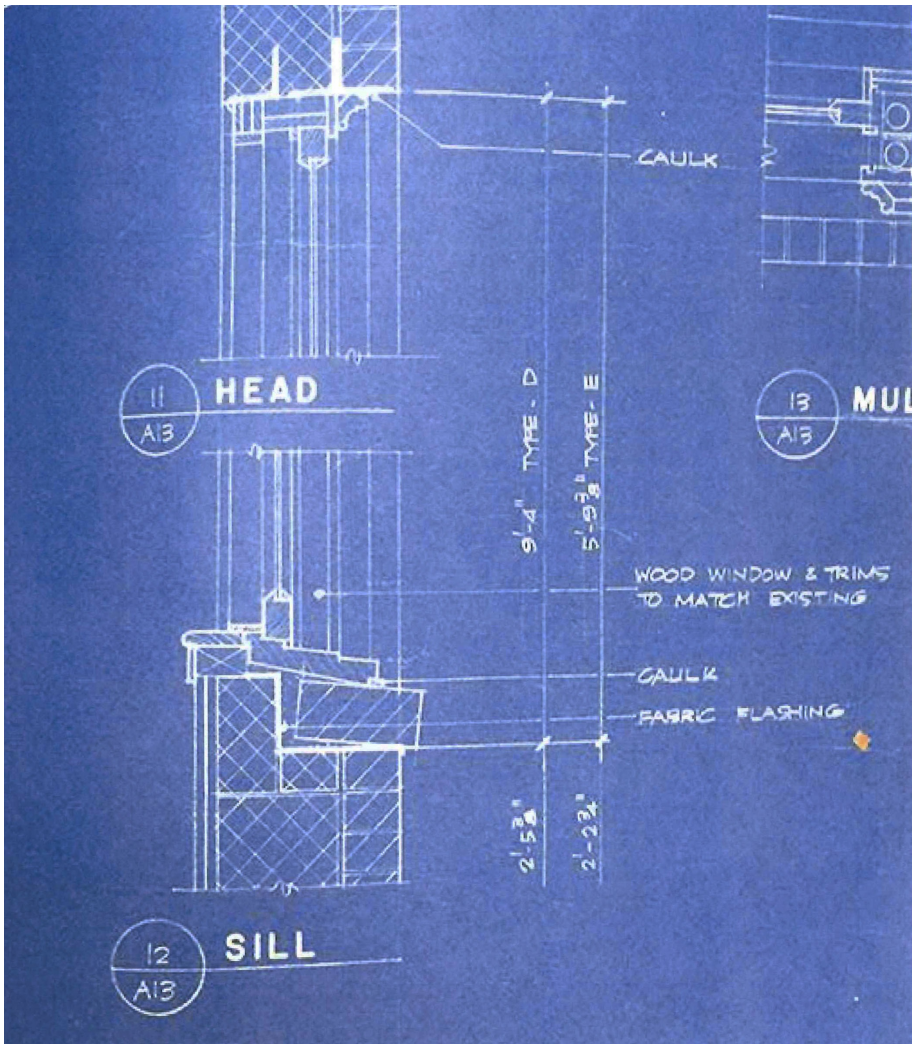
ATTACHMENTS: Details

by: Martin A. Benassi
Martin A. Benassi, AIA - Architect LLC
Two Broadway
Hamden, CT 06518


2"
V.I.F.
AIR AND VAPOR BARRIER
4" BRICK TO MATCH EXISTING.
RIGID INSULATION
CAVITY DRAINAGE MATERIAL
RAFL FLASHING
WEEP HOLES @ 24" O.C. MIN.
STEEL LINTEL, SEE LINTEL SCHED.
BOND BEAM, SEE LINTEL SCHED.
CAULK PERIMETER BOTH SIDES, TYP.
VARIES
H.M.F., GROUT FILL ENTIRE FRAME (TYP.)
3"
7 3/4"
METAL DRIP EDGE, TYP.
H-9
TYP. HEAD @ CAVITY WALL


1" AIR SPACE.
RAFL FLASHING
4" FACE BRICK
WEEP VENTS @ 24" O.C. (2) PER HEAD MIN.
METAL DRIP EDGE, TYP.
CAULK AND BACKER ROD ENTIRE PERIMETER, BOTH SIDES, TYP. U.O.N.
DRAINABLE ALUMINUM LOUVER.
3"
INSECT SCREEN.
LH-1
HEAD @ ALUM. LOUVER


FABRIC FLASHING
STEEL LINTEL (EXISTING AT TYPE A WINDOWS)
CAULK
2 3/4"
HEAD
CAULK
SILL
FABRIC FLASHING
BRICK SILL (EXISTING AT TYPE A WINDOWS)
CAULK
2" 2 3/4"
5 1/2"
WINDOW DETAILS
SCALE: 3" = 1'-0"
6
A-7


CAULK
11
A13
HEAD
13
A13
9'-4" TYPE - D
5'-8 3/8" TYPE - E
WOOD WINDOW & TRIMS TO MATCH EXISTING
CAULK
FABRIC FLASHING
2'-5 3/8"
2'-2 3/4"
12
A13
SILL